

REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This Response is in reply to the final Office Action mailed May 10, 2005 (hereinafter, the "Office Action"). A Request for Continued Examination is submitted herewith.

In the Office Action, claims 1, 3, 4, 8-28, 33 and 36-41 were pending. Claims 1, 3, 4, 8-10, 36 and 37 were allowed. Claims 11-28, 33 and 38-41 were rejected. Claims 1, 3, 4, 8-28, 33 and 36-40 remain in the application. Claim 41 has been canceled without prejudice.

Claims 42-48 have been added herein. Support for new claims 42-48 can be found in at least lines 25-30 of page 12 of the specification as filed, as well as FIGs. 1-2 and 18 of the figures.

Applicant expresses appreciation to the Examiner for the indication of allowable subject matter in claims 1, 3, 4, 8-10, 36 and 37.

Specification

Objection was raised to the specification as failing to provide proper antecedent basis for the claimed subject matter. Specifically, it was held that "[t]he holes comprising a substantially round elongate chamber having a depth greater than a width, as set forth in claims 40 and 41 does not have antecedent basis in the specification."

Claim 41 has been canceled. Applicant respectfully submits that the limitations set forth in claim 40 have support in the specification as filed, including the figures as filed. For example, the specification is replete with references to registration pin holes 40 for receiving registration pins 42 (see, for example, page 9, line 6), and these registration pin holes 40 are shown throughout the figures. In FIG. 14a, the registration pin hole 40 is clearly shown as having a depth at least about four times that of a width of the hole. In FIGs. 1a, 7 and 9, the registration pin holes are clearly shown having an upper opening that is circular or round.

Thus, applicant submits that support for the claim limitation of registration pin holes that comprise “a substantially round elongate chamber having a depth greater than a width” has support and antecedent basis in the specification as filed.

Claim Rejections - 35 U.S.C. § 103

Claims 11-16, 18-25, 27, 28, 38 and 39 (including independent claims 11 and 21) were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,466,152 (“Walter”) in view of U.S. Patent No. 5,403,185 (“Presswood”).

Claims 11-17, 19-26, 28, 38 and 39 (including independent claims 11 and 21) were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,788,489 (“Huffman”) in view of Presswood.

Independent claims 40 and 41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Walter in view of Presswood.

In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to independent claims 11, 21 and 33, with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

Applicant respectfully asserts that the obviousness rejections under the combination of the cited references are improper. Thus, withdrawal of these rejections is respectfully requested.

Before discussing the rejections, it is thought proper to briefly state what is required to sustain such a rejection. The issue under § 103 is whether the PTO has stated a case of *prima facie* obviousness. “The PTO has the burden under § 103 to establish a *prima facie* case of obviousness.” In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). To satisfy this burden, the PTO must meet the criteria set out in M.P.E.P § 706.02(j):

. . . three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference

(or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Moreover, the obviousness analysis must comply with the statutory scheme as explained by the Supreme Court in Graham v. John Deere Co., 383 U.S. 1, 17 (1966), namely, consideration must be given to: (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed invention, (3) the level of ordinary skill in the pertinent art, and (4) additional evidence, which may serve as indicia of non-obviousness.

With the above background in mind, Applicant contends that the Office Action has failed to meet the burden of establishing a *prima facie* case of obviousness, and that the obviousness rejections were based on hindsight. Specifically, the Office Action has failed to show that the cited references provide sufficient teachings or the motivation for the asserted combination in order to arrive at Applicant's invention.

The Walter and Huffman references appear to disclose so-called “single pour” systems in which dental casting material is disposed onto the tray, and into the registration pin holes. The Walter and Huffman references fail to even recognize the problems associated with dental casting material entering the pin holes, and certainly fail to disclose any means for preventing it. The Presswood reference appears to disclose a so-called “double pour” system in which dental plaster is first disposed in the impression with the ends of the pins disposed in the dental plaster until it hardens; and then dental plaster is disposed in the tray with the tray opened and the pins removed from the pin holes so that dental plaster enters into the pin holes. Again, even Presswood fails to recognize the problems associated with dental casting material entering the pin holes. The Walter, Huffman and Presswood references do not teach inserting pins into pin holes and through a membrane, and leaving the pins in the pin holes while dental casting material is disposed onto the tray with the pins so resisting dental casting material from entering the pin holes.

In contrast, the instant claims (claims 11, 21 and 33) are drawn to disposing dental casting material over the registration pin on the working tray of the dental articulator while the registration pin remains in the registration pin hole; maintaining a position of the at least one

registration pin in the registration pin hole through the thin membrane while the dental casting material is disposed on a surface of the working tray and over a head of the at least one registration pin; or introducing dental casting material on the working tray and over the registration pin while the registration pin remains in the registration pin hole. The registration pin is pressed through a thin membrane extending across the plurality of registration pin holes on the working tray of a dental articulator so that the registration pin breaks the thin membrane and extends through the thin membrane. The thin membrane maintains the pins in the pin holes and resists dental casting material from entering the pin holes.

No *Prima Facie* Case of Obviousness

Applicant respectfully asserts the Office Action's combination of Walter or Huffman with Presswood does not satisfy the requirements for establishing a *prima facie* case of obviousness because the references themselves do not provide the motivation for combination with the other. The Walter or Huffman references only teach pouring dental plaster onto the trays and into the pin holes without the need to resist dental plaster from entering the pin holes, and without a membrane to cover such pin holes. The Presswood reference teaches only to pierce the membrane and then remove the pins, and to then pour dental plaster onto the tray and into the pin holes. All the cited references are completely devoid of discussing difficulties associated with having dental plaster in the pin holes. In addition, the Walter and Huffman references teach single pour systems while the Presswood reference teaches a double pour system. Accordingly, the teachings are mutually exclusive and do not overlap in any way that could lead one of ordinary skill in the art from one to the other.

The contents of these references do not support the Office Action's proposed combination. Thus, the Office Action has not established a case of *prima facie* obviousness because the motivation for combination does not arise from the references themselves, and the Applicant respectfully requests withdrawal of these rejections.

Impermissible Hindsight

In addition, Applicant asserts that the Office Action has used the Applicant's own

specification as a roadmap for the proposed combination. The Courts have stated that an Applicant's specification cannot be the basis for motivation, i.e., no hindsight reconstruction. *Yamanouchi Pharmaceutical Co., Ltd. v. Danbury Pharmacal, Inc.*, 231 F.3d 1339, 56 U.S.P.Q.2d 1641 (Fed. Cir.), reh'g denied, 2000 U.S. App. LEXIS 34047 (2000). Accordingly, the use of the Applicant's specification to provide the teaching for using a membrane with a single pour system and leaving the pins in the pin holes is not permissible, and any rejection based on hindsight must be withdrawn.

To illustrate that hindsight has been used to reconstruct the invention, Applicant asserts that one of ordinary skill in the art would be required to combine two references with inapposite teachings to address a problem neither reference addresses. Since Walter and Huffman teach only a single pour system and pouring dental plaster over the open pin holes, and Presswood teaches only a double pour system with pins removed from the pin holes and pouring dental plaster over the open pin holes, only the impermissible use of hindsight could lead to the Office Action's proposed combination. Additionally, neither reference teaches the problem of pouring dental casting material into pin holes. The Examiner is respectfully requested to reconsider and withdraw these rejections.

Presswood Teaches Away from the Invention

Additionally, the Applicant asserts that the Presswood reference actually teaches away from the claimed invention. The Courts have stated that when a prior art reference is used to support claim rejections, the reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1993), *cert. denied*, 469 U.S. 851 (1984). Since Presswood teaches removing the pins from the pin holes and pouring dental plaster over the open pin holes, Presswood actually teaches away from the instantly claimed invention. Thus, the instantly claimed invention cannot be rendered obvious by the Presswood reference alone or in combination with Walter or Huffman. As such, Applicant respectfully requests that the Examiner reconsider and withdraw all of these obviousness rejections.

Further, even if the Walter or Huffman and Presswood references are combined, they do not teach or suggest all of the elements of claims. Specifically, the references do not teach maintaining the pins in the pin holes while disposing dental casting material over the pins. Combining the references would only result in Presswood's double pour system with removing the pins from the pin holes while disposing dental plaster over the open pin holes in Walter's or Huffman's trays.

In contrast, independent claim 11 sets forth:

a) pressing a registration pin through a thin membrane extending across a plurality of registration pin holes on a working tray of a dental articulator so that the registration pin breaks the thin membrane and extends through the thin membrane;

b) forming a prepped model of a prepped tooth by disposing dental casting material over the registration pin on the working tray of the dental articulator while the registration pin remains in the registration pin hole, the prepped model of the prepped tooth to receive a dental prosthesis;

c) maintaining a position of the registration pin in the registration pin hole through the thin membrane while the prepped model of the prepped tooth is formed; and

d) forming an opposing model of an opposing tooth on an opposing tray of the dental articulator, the opposing model of the opposing tooth opposing the prepped tooth.

(Emphasis added).

Independent claim 21 includes the limitations of: . . .

a) obtaining an impression of at least some of a patient's teeth . . .

h) maintaining a position of the at least one registration pin in the registration pin hole through the thin membrane while the dental casting material is disposed on a surface of the working tray and over a head of the at least one registration pin;

i) disposing the working tray over the prepped side of the impression so that the dental casting material extends therebetween and forms a prepped model of the prepped tooth; and

j) removing the impression from the dental articulator.

(Emphasis added)

Independent claim 33 includes the limitations of:

a) obtaining an impression of at least some of a patient's teeth . . .

c) introducing dental casting material on the working tray and over the registration pin while the registration pin remains in the registration pin hole, to form a prepped model of a prepped tooth on the working tray of the

dental articulator, the prepped model of the prepped tooth to receive a dental prosthesis;

d) introducing dental casting material between an opposing tray and the opposing side of the impression to form an opposing model of an opposing tooth on an opposite tray of the dental articulator, the opposing model of the opposing tooth opposing the prepped tooth.

(Emphasis added)

Therefore, Applicant respectfully submits that independent claims 11, 21 and 33 are allowable over the Walter, Huffman and Presswood references, and urges the Examiner to withdraw the rejection. In addition, the dependent claims are allowable for at least their dependence on an allowable base claim.

It was held in the Office Action that “it would have been obvious to one skilled in the art to provide the device of Walter with a thin membrane extending across the registration pin holes and then press the registration pin through the membrane in view of Presswood in order to prevent leakage of dental plaster through the registration holes” and that “[c]learly one skilled in the art, using the disclosure of Presswood, would see the benefit of using the membrane and piercing it with the registration pin in order to prevent plaster from seeping through the unoccupied registration holes.” Applicant respectfully submits, that while each of these statements may or may not be true, they are not dispositive of the present case, as currently pending claim 11 includes the express limitations of: . . .

c) maintaining a position of the registration pin in the registration pin hole through the thin membrane while the prepped model of the prepped tooth is formed; and

d) forming an opposing model of an opposing tooth on an opposing tray of the dental articulator, the opposing model of the opposing tooth opposing the prepped tooth.

(Emphasis added).

Amended independent claim 21 includes the limitations of: . . .

h) maintaining a position of the at least one registration pin in the registration pin hole through the thin membrane while the dental casting material is disposed on a surface of the working tray and over a head of the at least one registration pin;

- i) disposing the working tray over the prepped side of the impression so that the dental casting material extends therebetween and forms a prepped model of the prepped tooth; and
- j) removing the impression from the dental articulator.
(Emphasis added)

Independent claim 33 includes the limitations of: . . .

- c) introducing dental casting material on the working tray and over the registration pin while the registration pin remains in the registration pin hole, to form a prepped model of a prepped tooth on the working tray of the dental articulator, the prepped model of the prepped tooth to receive a dental prosthesis;
- d) introducing dental casting material between an opposing tray and the opposing side of the impression to form an opposing model of an opposing tooth on an opposite tray of the dental articulator, the opposing model of the opposing tooth opposing the prepped tooth.
(Emphasis added)

Each of these claims includes the element of maintaining the registration pin in the registration pin hole, through the thin membrane, while dental casting material is applied over the registration pin (and over the surrounding thin membrane). The Examiner has failed to provide any teaching or suggestion for this limitation of the claims in any of the references of record. As is well known, to establish a *prima facie* case of obviousness, each and every element of the claimed invention must be found in the prior art reference or references. The only reference of record that includes a thin membrane is the Presswood reference. As indicated by the Examiner, the Presswood reference does not teach piercing the thin membrane with a registration pin and leaving the registration pin in the registration pin hole (through the thin membrane) while dental casting material is applied over the thin membrane. As none of the other references disclose a thin membrane, they surely cannot teach to pierce a membrane with a registration pin and leave the registration pin in the registration hole while applying casting material thereto. Thus, the element of Applicant's claimed invention that requires this step is not taught or suggested in the references combined by the Examiner, and the Examiner has therefore failed to establish a *prima facie* case of obviousness. As such, the rejections should be withdrawn.

The invention presently claimed in independent claims 11, 21 and 33 requires that the registration pin be maintained in the registration pin hole while dental casting material is applied to the trays (or on a surface of the working tray and over a head of the registration pin). In this manner, the present invention prevents dental casting material from entering the pin hole or interfering with the pin in the pin hole during the process of forming the dental model.

In contrast, as discussed in detail in Applicant's Response of February 22, 2005, the Presswood reference discloses a method of forming a prosthesis die that requires a membrane liner to be punctured with registration pins, after which the registration pins are removed from the membrane prior to applying dental plaster to the membrane while the holes are exposed by removal of the pins. Thus, the Presswood system results in uncured casting material entering the registration pin hole, which can then cure and harden within the hole: resulting in removal of the pin from the hole being much more difficult than in the present invention.

The aspect of the present invention that prevents this from happening addresses a long-felt need in the art of casting dental models that others have failed to solve. Applicant notes that the Presswood reference issued over ten years ago, and that the teaching of adding the membrane to the tray of Walter, as alleged in the Office Action, has not yet occurred in the art. The need to form dental models without having dental casting material enter registration pin holes during the process has remained problematic prior to the present invention. Prior art systems have failed to solve this problem because the methods utilized allow dental casting material to enter the registration pin holes after the registration pins have been removed therefrom (e.g., *after* piercing the thin membrane). In particular, the Presswood system includes the steps of puncturing a thin membrane with a registration pin, removing the registration pin, then covering the thin membrane with dental casting material. The dental casting material is allowed to enter the registration pin hole because the Presswood system requires removal of the pin during the casting process.

Attached hereto are seven affidavits from persons having numerous years of experience in the dental casting process, including Peter Coyne, who has 31 years of such experience; Unyoung Lee, who has 25 years of such experience, Jeff Stronk, who has 34 years of such experience; Mark Hester, who has 19 years of such experience; Marty Bingham, who has 21 years of such

experience; John Findlay, who has 35 years of such experience; and Mookey Kim, who has 32 years of such experience. Each of these attestors has worked many years in the present field, and each currently owns or operates/manages a business serving the industry. As stated in the declarations, the attestors have reviewed the claims now pending which were pending during the Office Action (e.g., presently pending claims 11-28, 33 and 38-40), and the cited prior art references and have concluded that the problem solved by the invention as presently claimed has remained problematic in the industry, even for the prior ten years after which the Presswood patent issued.

In addition, each of the attestors has stated that it would not be obvious for one skilled in the art to provide a membrane as taught by Presswood with a modeling method as taught in either the Walter or the Huffman patent. The attestors have also stated that resisting dental casting material from entering registration pin holes during the dental model casting process has remained problematic in the industry, even since the issuance of the Presswood patent, over ten years ago.

The problem of dental casting material entering pin holes has persisted, despite the teachings of Presswood, which led the attestors to conclude that it has not been obvious for one skilled in the art to provide a membrane as taught with Presswood with a modeling method as taught in the Walter patent or the Huffman patent. In their many years in the industry, none of the attestors have seen a system for forming a dental model in which a membrane is used during preparation of a prepped tooth using dental casting material with a registration pin maintained in a registration pin hole through the membrane while the model of the prepped tooth is formed.

Accordingly, Applicant respectfully submits that claims 11-28, 33 and 38-40 are allowable over the cited prior art references and requests that the Examiner withdraw the rejections.

In addition to these considerations, independent claim 42 has been added and includes the limitations of:

A dental articulating system configured to duplicate at least a portion of a patient's mouth for use in producing a dental prosthesis, the device comprising:

- a) a pair of trays . . .
- b) a plurality of registration pin holes . . .
- c) a thin membrane . . .
- d) at least one registration pin . . .
- e) at least one of the pair of trays having a stop rod opening formed therein, positioned adjacent a hinge end of the tray and in-line with the registration pin holes, the stop rod opening being operable to slidably receive therein a posterior stop rod securable within the stop rod opening and having an end configured to abut against the other tray to provide a physical stop between the trays to retain a desired occlusal relationship between the trays.

(Emphasis added)

Also, independent claim 44 has been added and includes the limitations of:

A dental articulating system configured to duplicate at least a portion of a patient's mouth for use in producing a dental prosthesis, the device comprising:

- a) a pair of U-shaped trays . . .
- b) a plurality of registration pin holes . . .
- c) a thin membrane, disposed across the registration pin holes . . .
- d) at least one registration pin . . . and
- e) at least one of the pair of U-shaped trays having a pair of stop rod openings formed therein, each stop rod opening being positioned adjacent a hinge end of the U-shaped tray on opposing sides of the U-shaped tray, the stop rod openings each being operable to slidably receive therein a posterior stop rod securable within the stop rod opening and having an end configured to abut against the other U-shaped tray to provide a physical stop between the U-shaped trays to retain a desired occlusal relationship between the trays.

(Emphasis added)

Also, new independent claim 46 is a method claim including limitations similar to those found in new system claim 42. Dependent claims 43, 45, 47 and 48 have also been added. Support for claims 42-48 can be found in at least lines 25-30 of page 12 of the specification as filed, as well as FIGs. 1-2 and 18 of the figures. In particular, FIG. 18 shows stop rod opening 62 having a posterior stop rod 64 disposed therein to form a vertical stop to retain a desired occlusal relationship between trays 11 and 12. The posterior stop rod as claimed is advantageous in that

the rearmost molar sections of the tray can be supported from moving closer to one another due to flexibility of the plastic assembly in the event that the molars are not part of the dental model being formed (prosthesis cases without the rearmost molars are known in the art as “free-end” posterior prosthesis cases). In this manner, the trays in free-end cases are restricted from closing further than dictated by the proper occlusal relationship between the lower and upper teeth of the patient.

None of the references made of record include such a limitation. While Whelan discloses a stop pin 29, the stop pin is located at the center of the Whelan assembly, not adjacent a hinge end of the tray between the hinge end of the tray and a hinge associated with the tray. Thus, the stop pin 29 of Whelan will not aid in preventing the trays from moving closer to one another due to flexibility of the modeling system. In addition, the Whelan stop pin must be threaded downwardly or upwardly to be adjusted: making the stop rod difficult to insert or remove fully, and to adjust through large displacements. The posterior stop rod of the present invention is slidable within the opening, and can accordingly be easily adjusted to a variety of vertical positions and simply bonded in place.

CONCLUSION

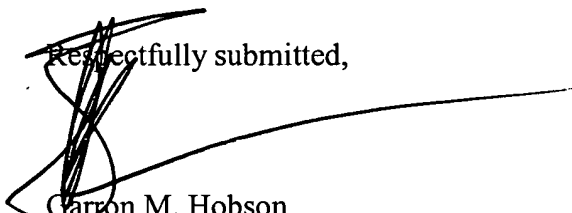
In light of the above, Applicant respectfully submits that pending claims 1, 3, 4, 8-28, 33 and 36-40 and 42-48 are in condition for allowance. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Response, the Examiner is strongly encouraged to call Garron M. Hobson at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

Three independent claims, claims 42, 44 and 46, were added herein, while one independent claim, claim 41, was canceled. Seven claims in excess of twenty total claims were added, claims 42-48, while one total claim in excess of twenty, claim 41, was canceled. A two-month extension is required to timely file this Response. A Request for Continued Examination is submitted herewith. Accordingly, Check No. 23355 is attached in the amount of \$970 for the RCE fee required by 37 C.F.R. § 1.17(e); for the addition of two independent claims in excess of three and six total claims in excess of twenty; and for the two-month extension of time.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Response to Deposit Account No. 20-0100.

DATED this 7th day of October, 2005.

Respectfully submitted,


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ATTACHMENTS:

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